



SEQUENCE LISTING

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TECH CENTER 1600/2900

<110> AUDONNET, Jean-Christophe  
BAUDU, Philippe

<120> CANINE HERPESVIRUS BASED RECOMBINANT LIVE VACCINE, IN  
PARTICULAR AGAINST CANINE DISTEMPER, RABIES OR THE  
PARAINFLUENZA 2 VIRUS

<130> 454313-2200.1

<140> 09/596,479

<141> 2000-06-19

<150> 09/213,053

<151> 1998-12-16

<150> 9608242

<151> 1996-06-27

<150> PCT/FR97/01115

<151> 1997-06-23

<160> 31

<170> PatentIn Ver. 2.1

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<212> DNA

<213> Canine herpesvirus

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<211> 398

<212> PRT

<213> Canine herpesvirus

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Asp Asn Val Cys Gly Glu Ile Leu Lys Thr Tyr Lys Lys Leu Glu Lys
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Cys Glu Pro Ile Asn Ile Leu Ser Ala Arg Trp Ser Ser Leu Val Asn
      50              55              60

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Thr Pro Lys Leu Cys Tyr Lys Leu Cys Val Asn Leu Ile Arg His Leu
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```

Gly Phe Pro Tyr Val Asn Val Ser Asp Met Glu Ala Asp Asp Val Cys
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Ala Asn Leu Tyr His Thr Asn Thr Ala Ala Gln Ile Tyr Thr Thr Asp
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Thr Asp Leu Ile Leu Met Gly Cys Asp Ile Ile Leu Asp Val Val Pro
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Leu Phe Pro Pro Thr Leu Arg Cys Arg Asp Ile Leu Ala Ser Leu Asn
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Leu	His	Gln	Ala	Pro	Ile	Leu	Lys	Ser	Val	Gln	Ser	Ile	Ile	Lys	Asn	165	170	175	
Lys	Tyr	Lys	Asn	Ser	Lys	Lys	Glu	Tyr	Asn	Ser	Asp	Ser	Gly	Asp	Ser	180	185	190	
Ser	Glu	Glu	Ser	Gly	Glu	Ile	Gln	His	His	Glu	Lys	Tyr	Leu	Asp	Gln	195	200	205	
Ile	Ser	Asn	Ser	Trp	Arg	Ile	Ser	Asp	Ser	Val	Ser	Thr	Asn	Ile	Val	210	215	220	
Ser	Ser	Ser	Glu	Glu	Ser	Ser	Asn	Ile	Thr	Ser	Ser	Glu	Ser	Ser	Asp	225	230	235	240
Thr	Asp	Ser	Phe	Gly	Ile	Pro	Lys	Asn	Gln	Asn	Gly	Phe	Lys	Ile	Leu	245	250	255	
Ser	Lys	Ile	Asn	Ser	Pro	Ser	Asn	Lys	Gly	Gln	Ser	Lys	Arg	Val	Thr	260	265	270	
Ala	Val	Asp	Glu	Asn	Ser	Leu	Asn	Leu	Lys	Tyr	Thr	Ser	Arg	Phe	Pro	275	280	285	
Pro	Ile	Met	Lys	Thr	Ile	Ser	Arg	Ser	Leu	Met	Met	Leu	Pro	Ala	Pro	290	295	300	
Gln	Thr	Lys	His	Glu	Val	Leu	Glu	Arg	Lys	Phe	Ile	Lys	His	Leu	Thr	305	310	315	320
Asn	Met	Ile	Thr	Pro	Glu	Tyr	Arg	Gly	Glu	Asn	Leu	Ser	Ile	Ile	Lys	325	330	335	
Arg	Val	Pro	Ile	Ile	Gln	Glu	Lys	Phe	Asp	Ile	Asn	Leu	Val	Tyr	Glu	340	345	350	
Thr	Leu	Leu	Ser	Phe	Ile	Asp	Asp	Lys	Glu	Lys	Ala	Lys	Asn	Leu	Thr	355	360	365	
Asn	Leu	Phe	Trp	Lys	His	Ile	Ser	Ile	Pro	Ile	Asp	Tyr	Asn	Leu	Val	370	375	380	
Leu	Ile	Ser	Tyr	Trp	Asp	Asp	Ser	Lys	Ser	Arg	Arg	Trp	Val			385	390	395	

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<212> PRT

<213> Canine herpesvirus

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Asn Val Ile Lys Thr Asn Leu Val Tyr Lys Lys Lys Leu Leu Thr Phe	35	40	45
Ser Leu Asn Leu Asn Phe Tyr Phe Leu Lys Phe Leu Leu Phe Cys Leu	50	55	60
Val Phe Lys Ala Met Ala Cys Phe Arg Pro Lys Thr Glu Phe Lys Ile	65	70	75
Thr Asn His Pro Ser Gln Ile Ile Asn Asn Glu Glu Asn Ile Asn Ser	85	90	95
Glu Glu Gly Lys Phe Ile Ser Gly Arg Ala Val Leu Glu Asp Gln Lys	100	105	110
Leu Arg Asp Val Ile Ser Met Leu Thr Pro Phe Ser Thr Ser Leu Lys	115	120	125
Asn Ser Phe Ile Val Phe Ser Asp Tyr Gly Met Met Ile His Thr Ser	130	135	140
Ile Cys Gly Glu Gln Ile Tyr Ile Pro Ile Ser Lys Asn Gln Phe Ser	145	150	155
Ser Tyr Phe Trp Gly Tyr Ser Asp Pro Ala Val Phe Leu Ala Asn Val	165	170	175
Asp Ser Lys Arg Gly Leu Leu Asp Val Phe Lys Ser Thr Ser Lys Met	180	185	190
Ser Lys Val Phe Phe Glu Ile Ser Asn Pro Ser Gln His Arg Met Leu	195	200	205
Lys Gln Val Ile Phe Thr Ile Ser Asp Ser Asn Ile Lys Cys Ser Thr	210	215	220
Leu Leu Lys Ala Glu Phe Ser Asn Tyr Cys Ile Met Leu Pro Ser Arg	225	230	235
Asn Pro Asp Phe Ser Leu Glu Leu Asn Lys Tyr Gln Leu Asn Lys Ile	245	250	255
Leu Glu Leu Asn Lys Lys Gln Asn Ser Leu Leu Lys Phe Glu Ser Asn	260	265	270
Glu Asn Asn Val Val Ile Ser Ser Glu Ser Gly Ser Val Ser Leu Asn	275	280	285
Leu Asp Arg Ser Asp Ser Glu Gly Glu Asp Ser Ala Ser Ile Leu Lys	290	295	300
Ser Ala Thr Lys Lys Val Asn Pro Tyr Leu Val Lys His Ser Glu Asn			

305                      310                      315                      320  
 Phe Lys Arg Leu Lys Phe Arg Trp Met Ile Ile Pro Ile Phe Phe Pro  
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 Leu Leu Lys Lys Leu Lys Leu Thr Asn Thr Thr Val Ser Ile Asn Phe  
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 Phe Phe Thr Pro Thr Thr Asn Pro Met Ile Ser Leu Thr Ser Ser Lys  
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 Pro Ile Gly Ile Ile Leu Phe Phe Phe Cys Thr Asn Glu Leu Gln His  
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 Lys Ser Leu Lys Arg Pro Ala Ser Pro Ser Asp Glu Glu Lys Pro Pro  
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 <213> Canine herpesvirus

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 Cys Leu Pro Cys Met Tyr Val Thr Thr Lys Ser Leu Leu Cys Ile Gly  
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 Leu Gln Ala Gly Ile Leu Thr Ala Leu Ile Ile Leu Ile Gln Ile Leu  
                                   50                                  55                                  60  
 Thr Glu Ser Phe Val Cys Ser Ile Ile Leu Ile Ala Thr Val Leu Ile  
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 Phe Thr Leu Ser Lys Ile Ser Ile Ser Thr Ser Glu Lys Ile Ser Ser  
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 Ile Cys Arg Ile Ser Gln Ser Ile Phe Val Thr Ile Ala Ala Phe Cys  
                                   100                                  105                                  110  
 Trp Gly Phe Asp Trp Ile Leu Asn Pro Ile Ala Ile Lys Ile Ile Leu  
                                   115                                  120                                  125  
 Ile Leu Ser Leu Ser Phe Leu Thr Ile Cys Thr Ile Lys Ile His Ile  
                                   130                                  135                                  140

Phe	Tyr	Leu	Ile	Ser	Ile	Leu	Asn	Gly	Ser	Gly	Ser	His	Val	Lys	Gly	
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Ser	Leu	Val	Thr	Ile	Leu	Phe	Gly	Thr	Ile	Leu	Gly	Val	Phe	Gly	Thr	
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Leu	Asn	Val	Ile	Lys	Ile	Glu	Ile	Leu	Ile	Gly	Phe	Gly	Ile	Ala	Leu	
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Cys	Ile	Ile	Leu	Ser	Asn	Thr	Asn	Phe	Gly	Leu	Val	Ile	Arg	Asp	Thr	
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			245						250					255		
Lys	Tyr	Pro	Ser	Met	Ile	Ile	Ile	Ser	Ile	Leu	Gly	Phe	Met	Leu	Thr	
			260					265					270			
Ile	Ala	Ile	Trp	Gly	Leu	Asn	Val	Tyr	Leu	Lys	Asn	Leu	Lys	Phe	His	
	275						280					285				
Ser	Pro	Phe	Thr	Leu	Val	Ile	Ser	Phe	Ile	Val	Gly	His	Cys	Leu	Ala	
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			325						330					335		
Val	Leu	Gly	Leu	Asn	Phe	Gly	Ser	Pro	Leu	Ile	Leu	Thr	Thr	Thr	Thr	
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Thr	Ile	Ser	Leu	Val	Ser	Leu	Leu	Tyr	Ile	Arg	Lys	Gln	Thr	Gln	Gly	
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<212> PRT

<213> Canine herpesvirus

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Ile Ile Pro Thr Ser Ala Asn Glu Ser Pro Ala Ser Ile Asp Thr Thr  
35 40 45

Ile Thr Lys Pro Ile Ser Thr Glu Ala Asn Asn Leu Lys Ser Val Ser  
50 55 60

Thr Ser Ile Lys Pro Pro Lys Asn Leu Lys Lys Lys Leu Leu Lys Ser  
65 70 75 80

Lys Cys Arg Asp Asn Val Ile Tyr Arg Pro Tyr Phe Ser Gln Leu Glu  
85 90 95

Ile Asn Cys Thr Ile Thr Lys Lys Gln Asn Leu Ser Asn Pro Leu Ile  
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Glu Leu Trp Phe Lys Glu Leu Ser Thr Tyr Asn Lys Thr Asn Glu Asn  
115 120 125

Val Glu Ser Leu Lys Thr Asp Ile Ser Lys Asn Ile Leu Leu Phe Ser  
130 135 140

Thr Lys Asn Asn Ser Asp Asn Phe Tyr Asn Asp Phe Leu Leu Gly Ile  
145 150 155 160

Gln Asn Gln Pro Val Asn Tyr Lys Leu Tyr Gly Ser Gln Phe Tyr Asp  
165 170 175

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180 185 190

Gly Ile Tyr Thr Trp Lys Leu Tyr Asn Ser Asn Asn Glu Ser Ile Phe  
195 200 205

Glu Thr Phe Lys Ile Gln Val Tyr Ala Tyr His Ser Pro Asn Val Asn  
210 215 220

Leu Lys Ser Asn Pro Ser Leu Tyr Asn Glu Asn Tyr Ser Ala Ile Cys  
225 230 235 240

Thr Ile Ala Asn Tyr Phe Pro Leu Glu Ser Thr Glu Ile Phe Trp Phe  
245 250 255

Asn Asp Gly Gln Pro Ile Asp Lys Lys Tyr Ile Asp Glu Thr Tyr Ser  
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Val Trp Ile Asp Gly Leu Ile Thr Arg Thr Ser Ile Leu Ser Leu Pro  
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Phe Ser Glu Ala Met Glu Ser Pro Pro Asn Leu Arg Cys Asn Val Glu  
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Trp Tyr Lys Asn Ser Lys Ala Ser Lys Lys Phe Ser Asn Thr Val Ile  
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 Gln Trp Leu Val Lys Asp Ile Pro Ile Asn Gly Asp Asp Ile Ile Ser  
 355 360 365  
 Gly Pro Cys Leu Asn His Pro Gly Leu Val Asn Ile Gln Asn Lys Ile  
 370 375 380  
 Asp Ile Ser Asp Tyr Asp Glu Pro Val Thr Tyr Lys Cys Ser Ile Ile  
 385 390 395 400  
 Gly Tyr Pro Ile Ile Phe Pro Asn Phe Tyr Asp Glu Lys Val Phe Asp  
 405 410 415  
 Ala Ser Asp Glu Asn Val Ser Lys Ser Met Leu Ile Ser Ile Thr Thr  
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 35 40 45  
 Ile Leu Leu Thr Ile Ala Ala Ile Ile Phe Thr Phe Ile Phe Thr Val  
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 Pro Leu Glu Met Leu Gly Ser Ile Asn Cys Pro Pro Ser Thr Phe Gly  
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105

110

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<210> 10  
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<210> 12

<211> 36

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<210> 13

<211> 35

<212> DNA

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<400> 13

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<210> 14

<211> 38

<212> DNA

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<223> Oligonucleotide JCA077 used in PCR reaction to obtain 1030 bp fragment

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<210> 15

<211> 36

<212> DNA

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<223> Oligonucleotide JCA078 used for preparation of plasmid pPB204

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<210> 16  
<211> 36  
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<210> 17  
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<210> 18  
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<220>  
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<210> 19  
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<223> Oligonucleotide JCA084 used in PCR reaction to obtain 1837 bp fragment

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<210> 22

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<212> DNA

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<210> 23

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<223> Oligonucleotide JCA086 used in PCR reaction to obtain 2011 bp fragment

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<210> 31

<211> 1394

<212> PRT

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Asn Val Ile Lys Thr Asn Leu Val Tyr Lys Lys Lys Leu Leu Thr Phe  
35 40 45

Ser Leu Asn Leu Asn Phe Tyr Phe Leu Lys Phe Leu Leu Phe Cys Leu  
50 55 60

Val Phe Lys Ala Met Ala Cys Phe Arg Pro Lys Thr Glu Phe Lys Ile  
65 70 75 80

Thr Asn His Pro Ser Gln Ile Ile Asn Asn Glu Glu Asn Ile Asn Ser  
85 90 95

Glu Glu Gly Lys Phe Ile Ser Gly Arg Ala Val Leu Glu Asp Gln Lys  
100 105 110

Leu Arg Asp Val Ile Ser Met Leu Thr Pro Phe Ser Thr Ser Leu Lys  
115 120 125

Asn Ser Phe Ile Val Phe Ser Asp Tyr Gly Met Met Ile His Thr Ser  
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Ile Cys Gly Glu Gln Ile Tyr Ile Pro Ile Ser Lys Asn Gln Phe Ser  
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Ser Tyr Phe Trp Gly Tyr Ser Asp Pro Ala Val Phe Leu Ala Asn Val  
165 170 175

Asp Ser Lys Arg Gly Leu Leu Asp Val Phe Lys Ser Thr Ser Lys Met  
180 185 190

Ser Lys Val Phe Phe Glu Ile Ser Asn Pro Ser Gln His Arg Met Leu  
195 200 205

Lys Gln Val Ile Phe Thr Ile Ser Asp Ser Asn Ile Lys Cys Ser Thr  
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Leu Leu Lys Ala Glu Phe Ser Asn Tyr Cys Ile Met Leu Pro Ser Arg  
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 275 280 285  
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 290 295 300  
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 370 375 380  
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 385 390 395 400  
 Lys Ile Gln Cys Gly Phe Phe Ser Gln His Phe Val Asn Thr Asp Val  
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 420 425 430  
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 465 470 475 480  
 Ile Gln Ile Leu Thr Glu Ser Phe Val Cys Ser Ile Ile Leu Ile Ala  
 485 490 495  
 Thr Val Leu Ile Phe Thr Leu Ser Lys Ile Ser Ile Ser Thr Ser Glu  
 500 505 510  
 Lys Ile Ser Ser Ile Cys Arg Ile Ser Gln Ser Ile Phe Val Thr Ile  
 515 520 525



Ala Ala Phe Cys Trp Gly Phe Asp Trp Ile Leu Asn Pro Ile Ala Ile  
 530 535 540  
 Lys Ile Ile Leu Ile Leu Ser Leu Ser Phe Leu Thr Ile Cys Thr Ile  
 545 550 555 560  
 Lys Ile His Ile Phe Tyr Leu Ile Ser Ile Leu Asn Gly Ser Gly Ser  
 565 570 575  
 His Val Lys Gly Ser Leu Val Thr Ile Leu Phe Gly Thr Ile Leu Gly  
 580 585 590  
 Val Phe Gly Thr Leu Asn Val Ile Lys Ile Glu Ile Leu Ile Gly Phe  
 595 600 605  
 Gly Ile Ala Leu Cys Ile Ile Leu Ser Asn Thr Asn Phe Gly Leu Val  
 610 615 620  
 Ile Arg Asp Thr Cys Tyr Tyr Arg Ile Gly Arg Tyr Lys Leu Met Arg  
 625 630 635 640  
 Thr Phe Thr Asp Leu Gly His Gly Ala Ser Tyr Ser Ile Glu Glu Asp  
 645 650 655  
 Glu Thr Ser Asp Tyr Ser Glu Ile His Glu Arg Lys Ile Ser Ser Phe  
 660 665 670  
 Gln Leu Ile Tyr Lys Tyr Pro Ser Met Ile Ile Ile Ser Ile Leu Gly  
 675 680 685  
 Phe Met Leu Thr Ile Ala Ile Trp Gly Leu Asn Val Tyr Leu Lys Asn  
 690 695 700  
 Leu Lys Phe His Ser Pro Phe Thr Leu Val Ile Ser Phe Ile Val Gly  
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 His Cys Leu Ala Phe Leu Val Glu Pro Phe Asn Tyr Lys Ile Lys Cys  
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 Ile Ser Arg Ile Ile Leu Ile Ile Cys Leu Leu Leu Glu Leu Ile Ala  
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 Ser Leu Ile Ser Val Leu Gly Leu Asn Phe Gly Ser Pro Leu Ile Leu  
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 Lys Thr Ile Asn Met Ser Phe Lys Asn Phe Tyr Leu Ile Tyr Val Ile  
 820 825 830

Ile	Ile	Phe	Ile	Asn	Ser	Ile	Ile	Thr	Ser	Ala	Ser	Thr	Ser	Lys	Pro
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865					870					875					880
Lys	Ser	Val	Ser	Thr	Ser	Ile	Lys	Pro	Pro	Lys	Asn	Leu	Lys	Lys	Lys
				885					890					895	
Leu	Leu	Lys	Ser	Lys	Cys	Arg	Asp	Asn	Val	Ile	Tyr	Arg	Pro	Tyr	Phe
			900					905					910		
Ser	Gln	Leu	Glu	Ile	Asn	Cys	Thr	Ile	Thr	Lys	Lys	Gln	Asn	Leu	Ser
		915					920					925			
Asn	Pro	Leu	Ile	Glu	Leu	Trp	Phe	Lys	Glu	Leu	Ser	Thr	Tyr	Asn	Lys
	930					935					940				
Thr	Asn	Glu	Asn	Val	Glu	Ser	Leu	Lys	Thr	Asp	Ile	Ser	Lys	Asn	Ile
945					950					955					960
Leu	Leu	Phe	Ser	Thr	Lys	Asn	Asn	Ser	Asp	Asn	Phe	Tyr	Asn	Asp	Phe
				965					970					975	
Leu	Leu	Gly	Ile	Gln	Asn	Gln	Pro	Val	Asn	Tyr	Lys	Leu	Tyr	Gly	Ser
			980					985					990		
Gln	Phe	Tyr	Asp	Asn	Gly	Asn	Ile	Leu	Leu	Asn	Ile	Lys	Ser	Val	Asp
		995					1000					1005			
Phe	Lys	Thr	Ser	Gly	Ile	Tyr	Thr	Trp	Lys	Leu	Tyr	Asn	Ser	Asn	Asn
	1010					1015					1020				
Glu	Ser	Ile	Phe	Glu	Thr	Phe	Lys	Ile	Gln	Val	Tyr	Ala	Tyr	His	Ser
1025					1030					1035					1040
Pro	Asn	Val	Asn	Leu	Lys	Ser	Asn	Pro	Ser	Leu	Tyr	Asn	Glu	Asn	Tyr
			1045						1050					1055	
Ser	Ala	Ile	Cys	Thr	Ile	Ala	Asn	Tyr	Phe	Pro	Leu	Glu	Ser	Thr	Glu
			1060					1065					1070		
Ile	Phe	Trp	Phe	Asn	Asp	Gly	Gln	Pro	Ile	Asp	Lys	Lys	Tyr	Ile	Asp
		1075					1080					1085			
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		1090				1095					1100				
Leu	Ser	Leu	Pro	Phe	Ser	Glu	Ala	Met	Glu	Ser	Pro	Pro	Asn	Leu	Arg
1105					1110					1115					1120
Cys	Asn	Val	Glu	Trp	Tyr	Lys	Asn	Ser	Lys	Ala	Ser	Lys	Lys	Phe	Ser
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Asn Thr Val Ile Pro Lys Val Tyr Tyr Lys Pro Phe Ile Ser Ile Lys  
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Phe Asp Asn Gly Leu Ala Ile Cys Asp Ala Lys Cys Val Ser Arg Glu  
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Asn Asn Lys Leu Gln Trp Leu Val Lys Asp Ile Pro Ile Asn Gly Asp  
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Asp Ile Ile Ser Gly Pro Cys Leu Asn His Pro Gly Leu Val Asn Ile  
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Gln Asn Lys Ile Asp Ile Ser Asp Tyr Asp Glu Pro Val Thr Tyr Lys  
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Cys Ser Ile Ile Gly Tyr Pro Ile Ile Phe Pro Asn Phe Tyr Asp Glu  
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Lys Val Phe Asp Ala Ser Asp Glu Asn Val Ser Lys Ser Met Leu Ile  
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Ala Gln Leu Val Leu Thr Asp Ile Pro Leu Glu Asp Val Glu Asn Lys  
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Asp Asn Val Cys Ile Glu Pro Ile Lys Lys Ser Ile Asn Ser Tyr Ser  
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Ser Thr